

# Michael Dolce

## Curriculum Vitae

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### Education

- Present** **Doctoral Candidate, Physics.**, *Tufts University*, Medford, MA.  
**2020** **Masters of Science, Physics**, *Tufts University*, Medford, MA.  
**2017** **Bachelor of Science, Physics**, *SUNY University at Albany*, Albany, NY.

### Research

*Tufts University* 2019–Present

- ▷ **PhD Thesis, measuring neutrino oscillation parameters** from the NOvA data using Markov Chain Monte Carlo and Hamiltonian Monte Carlo sampling.
- ▷ **Validation of the MK model** implementation in GENIE 3.2 to allow its official release.
- ▷ **NOvA central value tuning** and construction of uncertainties for hN FSI model in GENIE 3.
- ▷ **Study of nuclear binding energy in GENIE** and its impact on the NOvA experiment's analysis.

*Brookhaven National Laboratory* 2016–2017

- ▷ **Signal processing to maximize signal from background noise** on different configurations of the MicroBooNE anode plane detector.
- ▷ **Optimization of  $\nu_\tau$  events in DUNE detector Far Detector** to maximize the tau neutrino production rate for the Deep Underground Neutrino Experiment (DUNE).

*University at Albany* 2016

- ▷ **Validations study of Monte Carlo (MC) simulation** of the ATLAS inner detector's beamline, pixel layers, and pixel discs with data.

### Grants and Awards

- 2021-2022** Tufts Data-Driven Decision Making Research Fellowship provided by the National Science Foundation's Research Traineeship
- 2021** Graduate Research Excellence at Tufts (GREAT) Program
- 2021** Universities Research Association (URA) Visiting Scholar Program (VSP)
- 2017** Class of 1952 Award
- 2016** SULI Undergraduate Research Presentation
- 2013-2017** Dean's List recipient
- 2013-2015** Baldwin Honor's Scholar  
Research Institute for Scientists Emeriti (RISE) Scholar

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## Talks, Presentations, Posters

- 2020** **Michael Dolce**, for the NOvA Collaboration, *NOvA central value tuning and uncertainties for the hN FSI model in GENIE 3*, Talk at *New Perspectives 2020*, Fermilab, USA, July 20 to July 21, 2020.
- 2020** **Michael Dolce**, for the NOvA Collaboration, *NOvA central value tuning and uncertainties for the hN FSI model in GENIE 3*, Poster at *Neutrino 2020*, Chicago, USA, June 22 to July 2, 2020.
- 2016** **Michael Dolce**, for the DUNE collaboration, *Optimization of the LBNF/DUNE beamline for tau neutrinos*, Talk at conclusion of SULI program, Brookhaven National Laboratory, USA, August 12, 2016.

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## Selected Publications

- 2021** NOvA Collaboration, M.A. Acero *et al.* [NOvA and R. Group], “Search for active-sterile antineutrino mixing using neutral-current interactions with the NOvA experiment”, arXiv:2106.04673 [hep-ex].
- 2020** **M. Dolce**, J. Wolcott, and H. Gallagher, “GENIE 3.0.6 hN CV and uncertainties for 2020 analysis,” NOvA Internal Document 43724-v4 (2020).
- 2020** **M. Dolce**, “Removal Energy Investigation and Nuclear Potential Reweighting,” NOvA Internal Document 46463-v1 (2020).
- 2020** NOvA Collaboration, M.A. Acero *et al.* [NOvA and R. Group], “Search for Slow Magnetic Monopoles with the NOvA Detector on the Surface”, arXiv:2009.04867 [hep-ex].
- 2020** NOvA Collaboration, M. Acero *et al.*, “Supernova neutrino detection in NOvA”, arXiv:2005.07155 [physics.ins-det].
- 2018** MicroBooNE collaboration, C. Adams *et al.*, “Ionization electron signal processing in single phase LArTPCs. Part II. Data/simulation comparison and performance in MicroBooNE”, “JINST” 13 (2018) P07007, [1804.02583].

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## Collaboration Contributions

### NOvA Production Member

- 2019-2020** Team member in production campaign for NOvA’s 2020 analysis. Responsible for the submission, management, and optimization of computational jobs to FermiGrid computing cluster and off-site computing resources. Also managed NOvA datasets to be processed for collaboration use.

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## Academic Involvement & Outreach

- 2020-Present** **Diversity, Equity & Inclusion (DEI) Committee Member** of the Tufts Physics Department to put forth immediate and long-term actions to attract and support BIPOC and under-represented students in physics.

- 2018-Present** **Member of the Listening Project.** Tufts-Howard Hughes Medical Institute Inclusive Excellence Program: Listening to Students' Thinking in STEM. Examine student artifacts across the science discipline to improve the understanding of student ideas as an instructor.
- 2021** **Graduate Student Mentor** for incoming international graduate students to adapt and settle into the Tufts community.
- 2021** **Graduate Student Ambassador** for the Tufts Physics & Astronomy Department. Communicated with admitted graduate students to help them settle into the department.
- 2021** **Volunteer judge** in Massachusetts Region IV and MSEF high school science fair evaluating students' physics and coding-related projects.

### Recent Teaching Assignments

- 2017-2020** Teaching Assistant to Introductory Physics I & II discussion sections. Fostered environment for students to share and encourage their ideas, with an emphasis on scientific reasoning.
- 2019** Lead Teaching Assistant to Introductory Physics II laboratory sections. Managed the administrative and grading responsibilities of the labs for the TAs in addition to teaching a lab section.

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### Personal

- 2021** US Soccer Grassroots Coaching license.
- 2016** Initiation into Sigma Pi Sigma physics society.
- 2016** Initiation into Theta Tau professional engineering fraternity.